

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

The August 25, 2003 Office Action and the Examiner's comments have been carefully considered. In response, claims are cancelled, amended and added, and remarks are set forth below in a sincere effort to place the present application in form for allowance. The amendments are supported by the application as originally filed. Therefore, no new matter is added.

INFORMATION DISCLOSURE STATEMENT

The Examiner did not act on the Information Disclosure Statement filed May 15, 2003. It is respectfully requested that the Examiner return initialed copies of the forms PTO/SB/08A and PTO/SB/08B filed May 15, 2003 to confirm that the references listed therein have been considered and made of record. For the Examiner's convenience, attached hereto are copies of the form PTO/SB/08A and PTO/SB/08B filed May 15, 2003 along with a photocopy of the returned receipt postcard evidencing receipt thereof by the USPTO.

ELECTION/RESTRICTIONS

In the Office Action the Examiner acknowledges Applicants' election without traverse of Species A (Fig. 1, claims 1-6 and 9) and that claims 7, 8 and 10-16 are withdrawn from further consideration as being drawn to a non-elected species.

CLAIM OBJECTIONS

In the Office Action claims 1-6 and 9 are objected to. In response, claim 1 is amended to obviate the objection and claim 9 is cancelled. In view of the amendment of claim 1 and the cancellation of claim 9, reconsideration and withdrawal of the objection to claims 1-6 and 9 are respectfully requested.

PRIOR ART REJECTIONS

In the Office Action claims 1 and 2 are rejected under 35 USC 102(e) as being anticipated by USP 6,473,147 (Nakahara et al.). Claims 3, 4 and 9 are rejected under 35 USC 103 as being unpatentable over Nakahara et al. and further in view of JP 407104281A (Yamada). Claims 5 and 6 are rejected under 35 USC 103 as being unpatentable over Nakahara et al. and further in view of USP 5,831,710 (Colgan et al.).

In response, claim 1 is amended to more clearly define the present claimed invention over the cited references, and claim 9 is cancelled.

The present claimed invention as defined by amended claim 1 is directed to a liquid crystal display device including a first substrate (1), a second substrate (2) having a face opposing the first substrate, and a frame-shaped sealing member (3) which bonds the first and second substrates to each other. The frame-shaped sealing member includes a first side portion. The first and second substrates and the sealing member define a space therebetween. The liquid crystal display device includes a liquid crystal (L) which is sealed in the space defined by the first and second substrates and the sealing member. The liquid crystal display device also includes a plurality of first wires (5), a plurality of second wires (6) perpendicular to the first wires, a plurality of leading wires (7) including extension portions (7a) which extend generally in parallel to the first wires and which are connected to the first wires, crossing portions (7b) which are generally perpendicular to the extension portions and which are respectively connected to a corresponding one of the second wires, and cross points (7c) defined by the coupling of the extension portions and the crossing portions, at least some of the cross points overlapping with the first side

portion of the sealing member. The liquid crystal display device also includes a frame-shaped light shielding film (17) defining a display area and being disposed on the first substrate. The frame-shaped light shielding film is disposed so as not to overlap with some of the cross points and the first side portion of the sealing member.

Amended claim 1 has the following features:

a. the leading wires have cross points of the extension portions, and the crossing portions and partial points among the cross points are overlapped with the first side portion of the sealing member, and

b. the light shielding film is formed so as not to overlap on the partial points of the cross points and the first side portion of the sealing member.

The present claimed invention achieves the advantage of preventing corrosion of the cross points of the leading wires due to ion impurities leaching from the sealing member by simultaneously satisfying features a and b.

Recently downsizing of portable information equipment such as cellular telephones has occurred. In a displaying device which is mounted on the portable information equipment, liquid crystal displays are preferred because of their low power consumption.

In order to reduce the size of the portable information equipment when a liquid crystal display is used, it is necessary to reduce the width of the liquid crystal display device. To do so, it is advantageous to form a terminal on a glass electrode substrate only on one side of the longitudinal direction of the electrode substrate, and to apply the structure wiring for leading wires only on the side surface of the width direction. It is possible to make the wide width shown in Figs. 10 and 11 of the present application, to a narrow width as shown in Fig. 7.

In order to make the width more narrow, it is possible to form at least one part of a leading wire lead to the side surface of the electrode substrate in a position overlapping a seal member sealing a liquid crystal, by adhering a pair of glass electrode substrates. In this way, the width becomes narrow because of the overlapping.

The inventors studied this structure and confirmed that in the leading wires which lead to the side surface, when the crossing point which is bent in a right angle direction to the side surface and a light shielding film formed around the display region and the sealing member overlap, corrosion occurs.

The inventors analyzed the reason for the corrosion. As a result, the inventors found that in the light shielding film, the same potential as the common electrode is impressed and in the

leading wires which have the same potential as the scan signal line, an electric field based on potential difference is generated. For example, the inventors identified the cause as the concentration of impurity ions included in the sealing member in each crossing point of the leading wires.

In amending claim 1, limitations from cancelled claim 3 are incorporated therein. In rejecting claim 3 the Examiner relied upon Nakahara et al. in combination with Yamada. In rejecting claim 3 the Examiner acknowledged that Nakahara et al. fails to disclose a frame-shaped light shielding film for defining a display area on the first/opposing substrate. In order to bridge the gap between claim 3 and Nakahara et al., the Examiner cited Yamada as teaching a frame-shaped light shielding film 102 for defining a display area on the first/opposing substrate, wherein the light shielding film is formed so as not to overlap on the first side portion of the sealing member 406 wherein the light shielding film is formed at a position spaced from the first side portion of the sealing member by a distance of $5\mu\text{m}$, which is less than 0.2mm, for providing high display quality.

Yamada does not close the gap between the present claimed invention as defined by amended claim 1 and Nakahara et al. For the Examiner's convenience, attached hereto is an English translation of Yamada.

As is evident from paragraphs 0044-0048 of the translation of Yamada, in Figs. 1(a) and 1(b), a shading film 102 is formed on the whole sacrifice section 402 except for a space section 403. A part of the shading film 102 is formed overlapping a sealant 302. In the second embodiment shown in Figs. 2(a) and 2(b), as mentioned in paragraph 0057-0063, one part of the shading film 102 is formed in a position overlapping a sealant 301 in the same way as the first embodiment of Yamada. Therefore, Yamada does not disclose, teach or suggest that the light shielding film is formed so as not to overlap with the cross points and the first side portion of the sealing member as now recited in amended claim 1.

None of the other references of record close the gap between the present claimed invention as defined by amended claim 1 and Nakahara et al. taken either alone or in combination with Yamada.

That is, the present claimed invention as defined by independent claim 1 is patentable over the cited references because the references do not disclose, teach or suggest:

a plurality of first wires, a plurality of second wires formed in a direction perpendicular to the first wires, and a plurality of leading wires including extension portions which extend generally in parallel to the first wires and which are connected to the first wires, crossing portions which are

generally perpendicular to the extension portions and which are respectively connected to a corresponding one of the second wires, the extension portions and the crossing portions being coupled and respectively defining cross points, at least some of the cross points overlapping with the first side portion of the sealing member, and/or

a frame-shaped light shielding film defining a display area and being disposed on the first substrate, the light shielding film being disposed so as not to overlap with some of the cross points and the first side portion of the sealing member (see claim 1, lines 12-26).

In view of the foregoing, claim 1 is patentable over the cited references under 35 USC 102 as well as 35 USC 103.

Claims 2 and 4-6 are patentable over the cited references in view of their dependence on claim 1 and because the references do not disclose, teach or suggest each of the limitations set forth in claims 2 and 4-6.

Claim 4 is amended to be dependent on claim 1 in view of the cancellation of claim 3.

NEW CLAIM

New claim 17 is added to the present application. Claim 17 further defines and limits the liquid crystal display device as

defined by claim 1, wherein the first substrate has a first electrode and the second substrate has a second electrode opposing the first electrode and the light shielding film is set to the same potential as the second electrode. Claim 17 is patentable over the cited references in view of its dependence on claim 1 and because the references do not disclose, teach or suggest each of the limitations set forth in claim 17.

It is respectfully submitted that no additional fees are due for the presentation of claim 17. However, if any additional fees are due, please charge our Deposit Account No. 06-1378 for such sum.

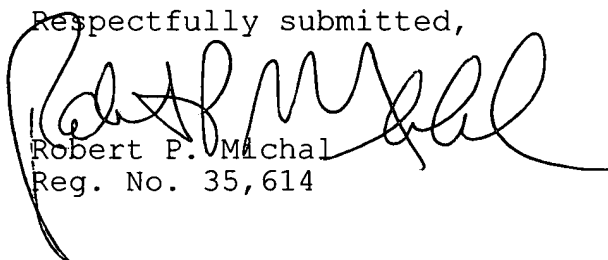
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Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

Appln. No. 09/910,752
Amendment dated November 25, 2003
Reply to Office Action of August 25, 2003

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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Dated: November 25, 2003

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- Encl.: 1) Forms PTO/SB/08A&B dated May 15, 2003 with copy of return receipt postcard
- 2) English translation of JP 7-104281